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Washington, D.C. 20554

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FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter of )

Deployment of Wireline Services Offering )  
Advanced Telecommunications Capability – )  
Further Notice of Proposed Rulemaking )

CC Docket No. 98-147

COMMENTS OF NORTEL NETWORKS INC.

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COMMENTS OF NORTEL NETWORKS INC.

Nortel Networks Inc. ("Nortel Networks") hereby addresses the technical issues raised in the First Report and Order and Further Notice of Proposed Rulemaking concerning steps the Commission can take to facilitate the availability of advanced telecommunications services.<sup>1/</sup> In order to fulfill one of the fundamental goals of the Telecommunications Act of 1996 – stimulating competition for all telecommunications services, including advanced services – the Commission adopted expanded and explicit requirements for Incumbent Local Exchange Carrier ("ILEC") provision of collocation services to Competitive Local Exchange Carriers ("CLECs"). The Commission also adopted certain spectrum compatibility rules to prevent ILECs from using concern about network harm to exclude the deployment of new technologies in situations where there is little likelihood of significant degradation of the network. In addition, the Commission sought comment on long term spectrum compatibility and management issues and "line

<sup>1/</sup> *Deployment of Wireline Services Offering Advanced Telecommunications Capability*, CC Docket No. 98-147, FCC 99-48, released March 31, 1999 (hereafter "*Further Notice*").

sharing” so as to facilitate an even more vibrant and competitive market for advanced telecommunications services throughout the country.

#### I. Introduction and Summary

Nortel Networks fully supports the Commission’s goal of fostering advanced telecommunications capabilities as reflected in the *Further Notice*. Time is of the essence in this matter. Technology is evolving rapidly and failure of the Commission to act in a timely manner to enable new innovations to be deployed rapidly will have dire consequences for the market.

Nortel Networks participated in earlier phases of this proceeding and related proceedings. In addition, Nortel Networks is an active participant in the industry standards setting bodies discussed in the *Further Notice*, such as Technical Subcommittee T1E1 addressing Digital Subscriber Line technologies.

Nortel Networks is the leading global supplier, in more than 100 countries, of digital telecommunications systems to businesses, universities, local, state and federal governments, the telecommunications industry, and other institutions. The company employs more than 30,000 people in the United States in manufacturing plants, research and development centers, and in marketing, sales and service offices across the country. Nortel Networks is also a leader in the development of xDSL technologies, and has sought Commission waiver of certain provisions of Part 68 in order to allow the timely deployment of its 1-Meg Modem and Elite Modem xDSL products.<sup>2</sup>

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<sup>2</sup> Northern Telecom Files Petition for Waiver, Public Comment Invited, File No. NSD-L-98-135, DA 98-2503, released December 11, 1998 (1-Meg Modem); Northern Telecom Files Petition for Waiver, Public Comment Invited, File No. NSD-L-98-144, DA 98-2639, released December 30, 1998 (Elite Modem). Nortel Networks recently completed a spin-off of the division responsible for developing the Elite Modem – Elastic Networks, Inc. – which will operate as an autonomous company. Elastic Networks will continue to pursue the waiver so as to be able to deploy the Elite Modem product, which is based on its EtherLoop technology.

As detailed below, Nortel Networks agrees with the Commission that the industry, under the auspices of Technical Subcommittee T1E1 Working Group T1E1.4, should bear responsibility for developing standards for spectrum compatibility and spectrum management. Nortel Networks believes that spectrum compatibility can be accomplished through spectrum masks, although that should not be the exclusive means of supporting the deployment of a new technology. Other methods for demonstrating compatibility could include calculation methods approved by an accredited standards body, such as Technical Subcommittee T1E1.

Nortel Networks believes that there should be some flexibility in the means by which network operators allow new technologies to be deployed in their networks. Individual network operators should be free to use industry-developed standards, or alternatively, mutually agree on spectrum management rules and policies, regardless of whether such mutually agreeable rules conform to the industry standards. Finally, Nortel Networks agrees with the *Further Notice* that “line sharing” is technically possible. Indeed, it is even possible for multiple service providers to share a high-speed data stream through use of multiple private virtual circuits.

## II. Spectrum Compatibility

The introduction of new high-speed services provided over twisted copper loops in the ILECs’ networks raises the possibility of unwanted cross-talk or other degradations when different technologies are deployed within the same or adjacent binder groups. The *Further Notice* recognizes that presently a common method for ensuring compatibility among different technologies is the use of spectrum masks. Nortel Networks concurs with the Commission’s assessment that spectrum masks are an effective means of

minimizing cross-talk or other incompatibility issues.<sup>3</sup> However, as the Commission also acknowledges, the development of spectrum masks is a dynamic, ongoing process, because new technologies are continually created.<sup>4</sup> The Commission likewise recognizes that such standards should be developed through an open, neutral process so that no party or groups of parties could act unilaterally to preclude the deployment of new technologies under the guise of preventing harm to the network.

The *Further Notice* tentatively concludes that an industry-driven process, with the participation of ILECs, CLECs and equipment manufacturers (along with the Commission), will work most effectively.<sup>5</sup> The *Further Notice* also concludes that such a process, in order to avoid retarding competition, must incorporate certain features: the process should be competitively neutral; the standards setting body should include representation from all affected interests; and all representatives to the body should have equal rights, with no factions having greater weight or veto authority.

Nortel Networks agrees with the Commission that Technical Subcommittee T1E1 is currently the best choice to undertake long-term PSD mask standards work, because it meets all of the criteria in the *Further Notice*. In addition, Technical Subcommittee T1E1 has already been undertaking the task of developing spectrum masks, and thus is intimately familiar with loop spectrum management issues. Moreover, Technical Subcommittee T1E1 has a proven track record, so there should be no controversy surrounding its selection.

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<sup>3</sup> *Further Notice* at ¶ 61.

<sup>4</sup> *Further Notice* at ¶ 79.

<sup>5</sup> *Further Notice* at ¶ 79.

Since Technical Subcommittee T1E1 operates on consensus within its working groups, this leaves considerable latitude for participants to delay the adoption of guidelines. It is therefore critical that the Commission set clear guidelines and timelines for such work. Doing so should ensure that policy decisions remain with the FCC and technical decisions with the industry.

Nortel Networks has been an active participant in this forum for many years, and as a result has full confidence in Technical Subcommittee T1E1's ability to address these standards issues on a fair, open and timely basis. Technical Subcommittee T1E1 is equally open to participation by all industry members. Technical Subcommittee T1E1 merely requires that any interested party pay a modest fee to participate. Moreover, the Commission's designation of Technical Subcommittee T1E1 as the forum charged with the long-term development of spectral compatibility standards will increase the incentives for parties interested in this issue, who are not currently participants, to join Technical Subcommittee T1E1. Thus, the Commission should reject unfair criticisms of Technical Subcommittee T1E1 as not being representative of the developing advanced services industry as a whole.<sup>6</sup>

This is not to say that Nortel Networks believes that Technical Subcommittee T1E1 must necessarily be the exclusive forum for addressing these issues. In designating Technical Subcommittee T1E1, the Commission should not preclude consideration of similar standards developed by other accredited industry standards bodies that meet the Commission's criteria.

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<sup>6</sup> *Further Notice* at ¶ 80.

With respect to spectrum compatibility, the *Further Notice* recognizes that there may be alternatives to developing a unique new spectrum mask for each new technology. The *Further Notice* posits two possible means for addressing spectral compatibility – generic masks and a calculation based approach.<sup>7</sup> Nortel Networks acknowledges the drawback of relying on technology specific spectrum masks as a means of ensuring spectral compatibility, because of the delays that can occur. Nortel Networks thus supports the development of generic masks, and urges the Commission to task Technical Subcommittee T1E1 with responsibility for developing such an approach. Because they would be generic, such masks would not put restrictions on modulation techniques and would not unduly limit design options.

At the same time, Nortel Networks strongly believes that the use of other approaches, such as a calculation based approach that is derived from cable cross-talk models and receiver models, should also be permitted,<sup>8</sup> provided those approaches are agreed to by an accredited industry standards body such as Technical Subcommittee T1E1 Working Group T1E1.4. Such a policy will ensure technology neutrality and avoid unnecessary delays in the deployment of new technologies.

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<sup>7</sup> *Further Notice* at ¶¶ 82-83.

<sup>8</sup> Performing a complete interference analysis using noise and receiver models should always remain an option. Indeed, Nortel Networks uses a variant of this approach in justifying its request for a waiver of Part 68 to allow the deployment of its Elite modem product, which does not rely on static spectral masks. Advanced spectrally agile systems such as the Elite modem prevent cross-talk interference with services on adjacent loops by sensing the presence of other sources of energy and automatically adapting their power level at various frequencies so that interference is avoided with other services. Between bursts, the Elite modem takes a spectral sample. From this sample the Elite modem calculates the required power ceiling levels for each symbol rate. The Elite modem dynamically adjusts itself according to the near end cross-talk (NEXT) information that it has measured. Through this periodic adjustment, the Elite modem maintains the highest available ceiling power levels for all frequencies and spectra consistent with the NEXT environment, thereby ensuring spectral compatibility with the known-to-be-coupled, 2-wire services sharing the same or adjacent binder group.



### III. Spectrum Management

The *Further Notice* acknowledges that in addition to spectral compatibility (addressed through means such as spectrum masks), an important factor to support a competitive market for advanced services is spectrum management.<sup>9</sup> The Commission seeks suggestions on how the industry can best develop fair and open deployment practices.<sup>10</sup> The *Further Notice* specifically seeks comment on binder group administration so as to maximize the deployment of new technologies within binder groups while minimizing cross-talk or other service degradations.<sup>11</sup>

Nortel Networks urges the Commission to look to the industry, through an open and non-discriminatory forum, to develop national guidelines. Nortel Networks believes that Technical Subcommittee T1E1 would be an appropriate body for such activities. The Commission should delegate to Technical Subcommittee T1E1 Working Group T1E1.4 the task of adopting a sound xDSL deployment model and planning process to be used in xDSL service rollouts based on technical considerations. The work now underway in Technical Subcommittee T1E1 Working Group T1E1.4, and reflected in draft Spectrum Management standard (T1E1.4/99-002R3), would appear to satisfy this requirement.

National guidelines will serve as a benchmark to ensure that carriers are not applying spectrum management techniques in a manner that discriminates against or

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<sup>9</sup> The *Further Notice* distinguishes between "spectrum compatibility" and "spectrum management." Spectrum compatibility refers to a service provider's general right to deploy a particular technology, while spectrum management refers to the provider's right to deploy a technology in a particular situation. *Further Notice* at ¶ 61.

<sup>10</sup> *Further Notice* at ¶¶ 84-85.

<sup>11</sup> *Further Notice* at ¶ 86.

disadvantages their competitors. On the other hand, it may not be possible to develop a single set of national standards that takes into account the widely varying networks deployed by ILECs in the country at present. Thus, as an alternative to the industry standard guidelines to be developed by Technical Subcommittee T1E1 (and reviewed by the Commission), operators should be permitted to use their own mutually agreed upon models and guidelines for spectrum management, provided they are (i) technically sound, (ii) based on good engineering practice, (iii) nondiscriminatory and (iv) readily available.

With respect to binder group administration, Nortel Networks recommends that, where practical, binder group separation be implemented according to the guidelines proposed in the draft Spectrum Management standard (T1E1.4/99-002R3). These industry-developed guidelines seek to facilitate the deployment of new technologies without adversely affecting current services. Nortel Networks recognizes, however, that AMI T1 services may currently be the only types being segregated in some ILEC plants. ILECs should be encouraged to segregate more broadly xDSL technologies according to their cross-talk compatibility where cable capacity permits, as a means of maximizing loop plant utilization.<sup>12</sup>

#### IV. Line Sharing

The *Further Notice* also seeks comment on a national requirement of line sharing, under which a customer could obtain voice service from one carrier and high-speed data service from a different carrier, with both services being provided over the same twisted

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<sup>12</sup> Toward this end, services defined as being spectrally compatible should be allowed to be deployed in any number within a binder group. Another class of services can be defined as being spectrally compatible in an adjacent binder group from the initial class. Those services should be deployed grouped together in any number in a binder group not containing the first group of services. This would create, for example, ADSL-type binders and T1-type binders where the types of services within the binders are restricted, but not their number.

copper loop. Nortel Networks agrees with the *Further Notice*'s conclusion that line sharing is technically feasible, as evidenced by the fact that it is already occurring in some instances.<sup>13</sup> Nortel Networks strongly supports line sharing as a means of facilitating the deployment of highly-efficient integrated solutions. Line sharing provides a way to preserve flexibility in how the business is structured (*i.e.*, who handles the voice service versus who handles the data traffic) while still deploying the most efficient, highly integrated technology.

In mandating the possibility of having the VF service provided by one carrier and the DSL service provided by another carrier over the same loop, the rules should not force the use of DSLAMs to provide equipment segregation between the two carriers. Integrated solutions should be allowed where a single line card provides both of the VF and DSL service. The line card then becomes a shared element just as the subscriber loop is. Thus, line sharing needs to also include line card sharing.

With respect to the technical parameters for line sharing, Nortel Networks does not believe that hard frequency boundaries between the voice and data portions of the line should be drawn by the Commission as a single, national standard. Rather, the notion of "good engineering practices," backed up by industry-standard compatibility criteria (*e.g.* 6 dB Signal-to-Noise Ratio margin) should be implemented by the system operators. In general, for basic POTS service, Nortel Networks recommends the frequency plan reflected in ANSI T1-413. However, Nortel Networks recognizes that exceptions may be appropriate, for example, for special services and wideband telephony.

To the extent the Commission decides to adopt national technical guidelines for line sharing, the Commission should rely on sound engineering practice, as reflected by

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<sup>13</sup> Further Notice at ¶ 103.

industry consensus standards developed by open, neutral bodies such as Technical Subcommittee T1E1. On the other hand, because of the diversity of networks, operators should be permitted to utilize their own mutually agreed upon practices, provided they are technically sound and based on good engineering practice.

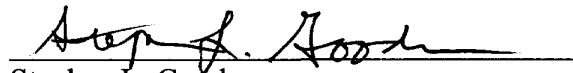
Nortel Networks also urges the Commission not to limit its consideration of line sharing to a single voice services provider and a single data services provider. In addition to basic voice and data connectivity, the line sharing rules should also support multiple private virtual circuits, which will allow the same customer to obtain data services from multiple service providers, all using the same local loop. Where xDSL is deployed, it is technically feasible to provide the end user with an aggregate of private virtual circuits on a high-speed data stream such as DS-3 running at 45 Mbps. These private virtual circuits could then be unbundled as desired from the high-speed data stream and handed off to different data service providers, allowing the customer additional choices.

## V. Conclusion

Nortel Networks shares the Commission's goal of fostering the deployment of advanced telephone services through the removal of possible impediments to new technologies, such as attempts by network operators to use network harm to exclude competitors unnecessarily. One way to avoid such exclusion is through the use of neutral, industry-developed spectrum compatibility standards. Nortel Networks believes that Technical Subcommittee T1E1 is currently the appropriate forum for developing the guidelines. Likewise, Nortel Networks believes that Technical Subcommittee T1E1 should be tasked with the development of pro-competitive spectrum management policies. Finally, Nortel Networks supports the Commission's conclusion that line sharing is technically feasible, and indeed should be expanded to include access to

multiple high-speed data service providers via private virtual circuits. Finally, Nortel Networks believes it is critical that the Commission complete these actions expeditiously, because of the growing importance to all Americans of access to advanced telecommunications services. By taking the steps suggested herein, the Commission will speed the introduction of widespread competition in the marketplace for advanced telecommunications capabilities, and thereby further the public interest.

Respectfully Submitted,

A handwritten signature in dark ink, appearing to read "Stephen L. Goodman", is written over a horizontal line.

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